The Air Combat Environment Test & Evaluation Facility (ACETEF)
Installed Systems Test Facility

Lessons Learned, Issues and Directions

31 March 2004

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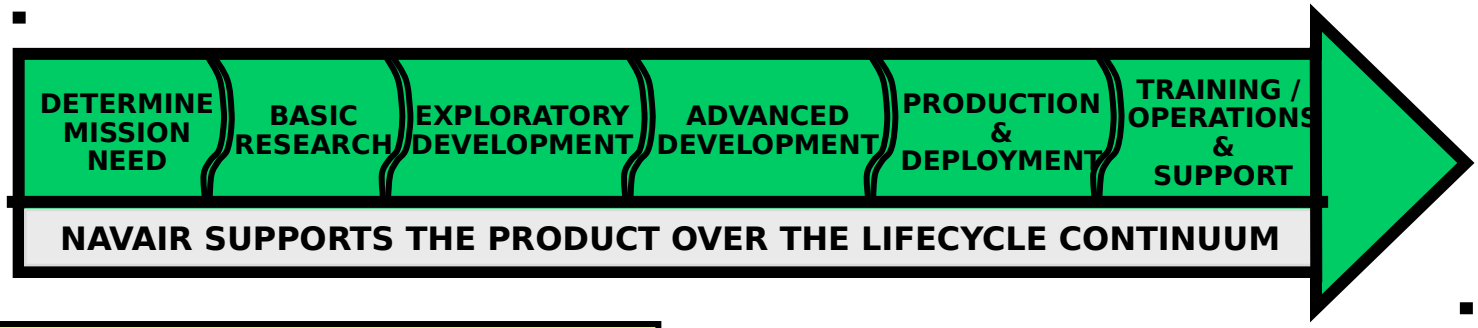
- Stood up 1990
- Aggregate $500M Infrastructure
- Annual 75% Direct, 25% MRTFB

ACETEF
NAWC-AD, Patuxent River, MD

Integrated Environment "Building Blocks" Applied Beyond Tradition T&E



Joint Strike Fighter
Virtual Strike Warfare Environment Exercises
Force Process Team Exercises

Joint Theater Missile Defense
Command and control evaluation to search out and destroy enemy surface launchers. ACETEF, RESA (San Diego), TACCSF, DS&ABL (Ft. Sill, OK)

Millenium Challenge 02
Playback/Excursion

Joint Combat Search and Rescue
Evaluate Multi-Service CSAR doctrine and numerous interoperability issues. AVTB (Ft. Rucker), TACCSF (Kirtland A… ACETEF

EP-3, P-3, E-2C
TDL, SDLS, GPS simulation and stimulation

EA-6B, F/A-18
EW Systems Testing

Rapid Response Trainers
AH-1W, F-14A, UH-1N, SH-60

V-22
DT, TPS Training, OT

TACCSF - Theater Air Command Simulation Facility
AVTB - Aviation Test Bed
RESA - Research Evaluation Systems Analysis
DS&ABL - Depth and Simultaneous Attack Battle Lab

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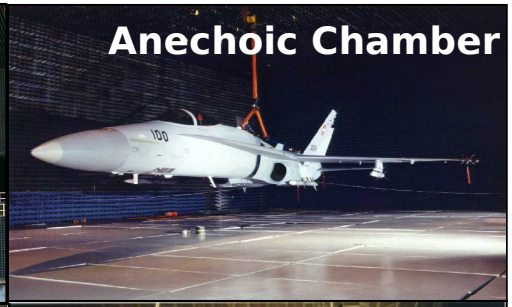
ACETEF Resources

Threat Air Defense Lab

Infra-Red Sensor Stimulator

AMES III Stimulator

Strategic Data Links Simulato



Instrumentation Lab

Minicrewstations

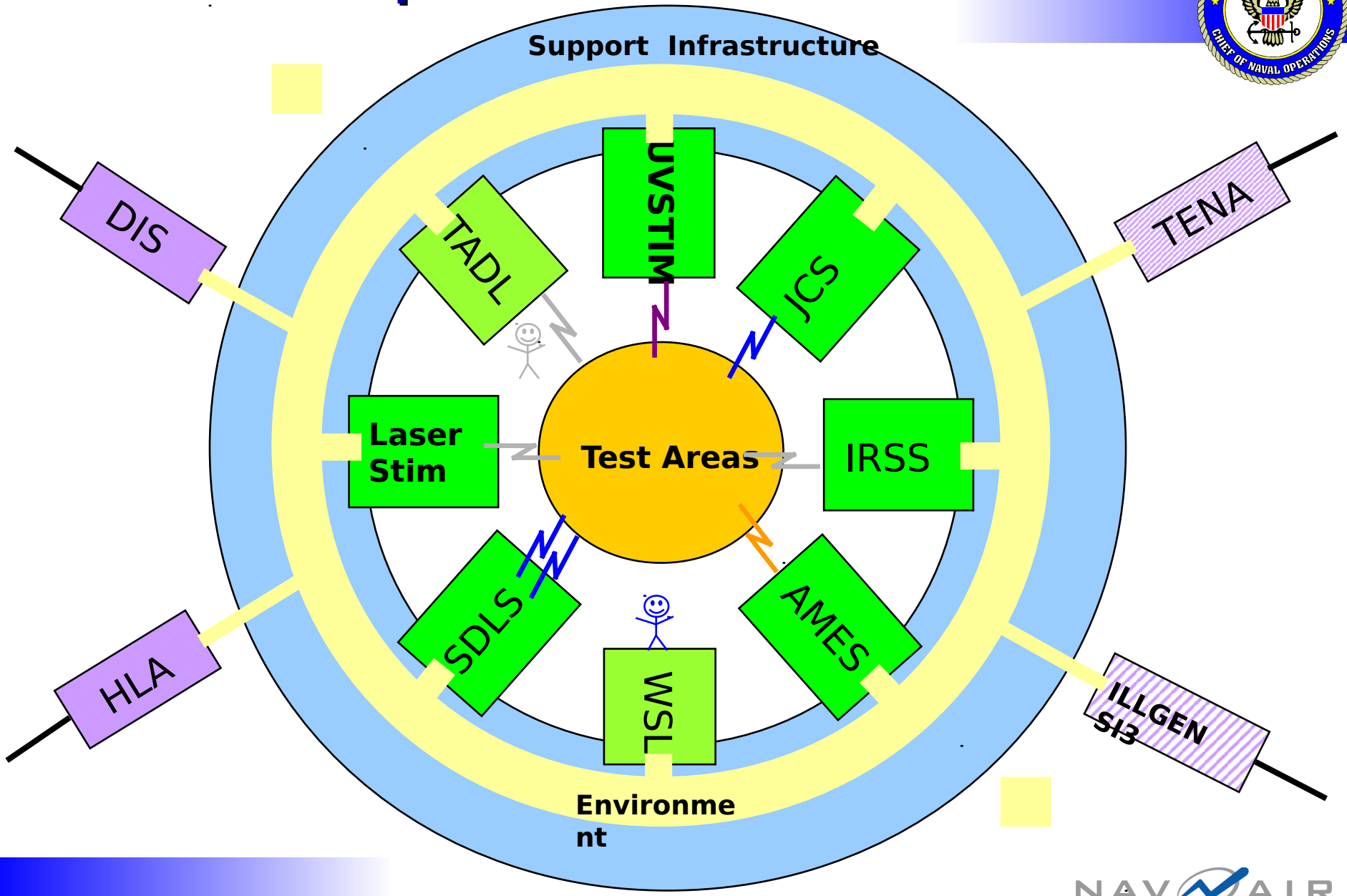
High Performance Computing

Manned Flight Simulator

Command Center

Joint Communications Simulator

ACETEF Concept



Environment Generator

- Joint Integrated Mission Model – ACETEF (JIMMACE)

Derived from the SUPPRESSOR, SWEG family

No more a “model” than Access is a “da

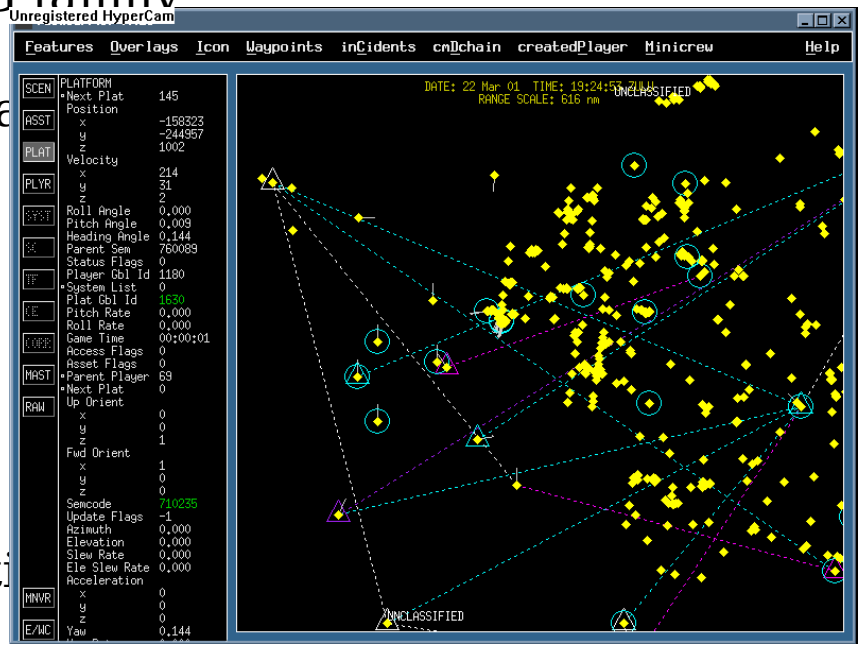
Language-based, event-driven engine

Extensive interface capabilities

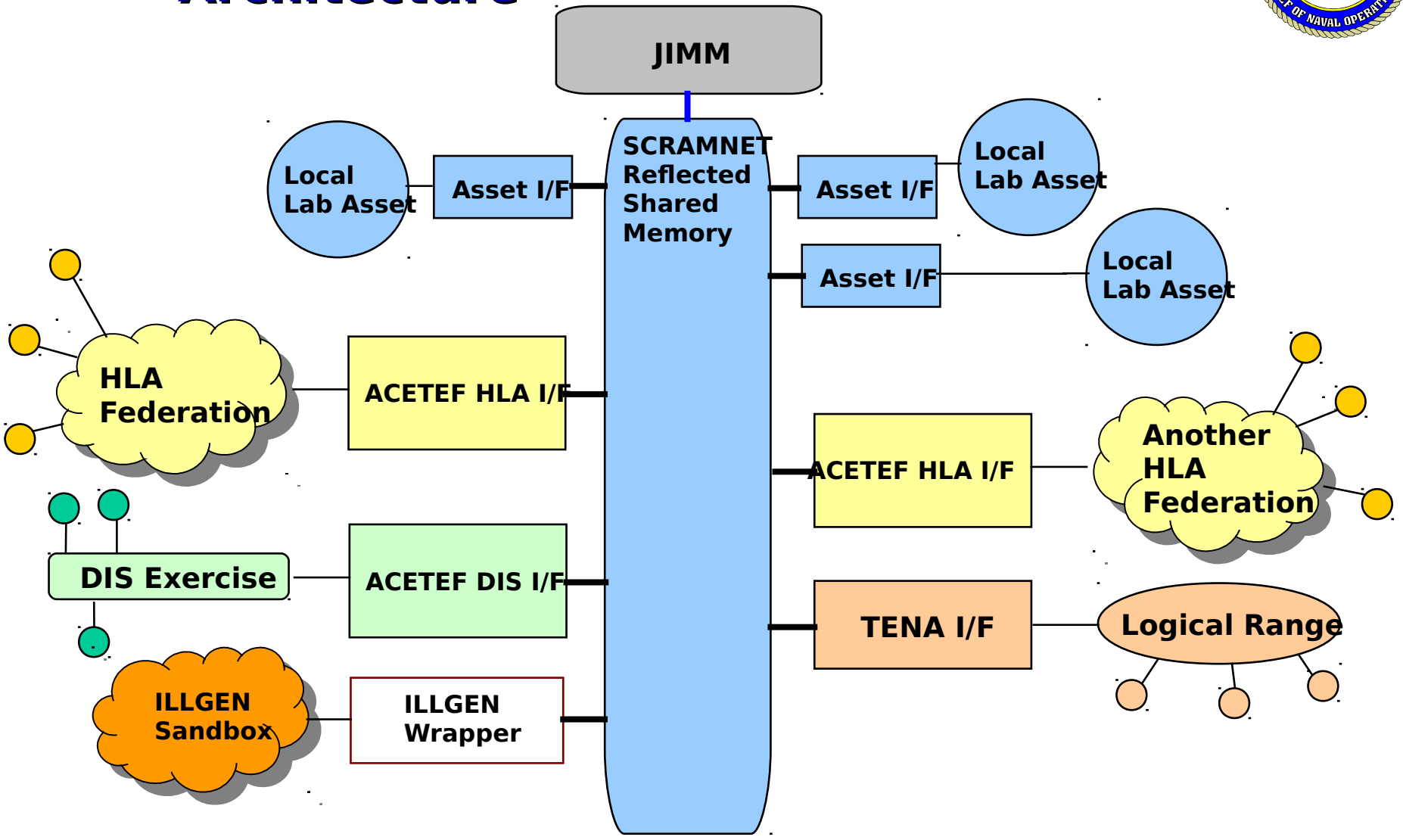
Powerful analytical output and logfiles

User-defined communications capabiliti

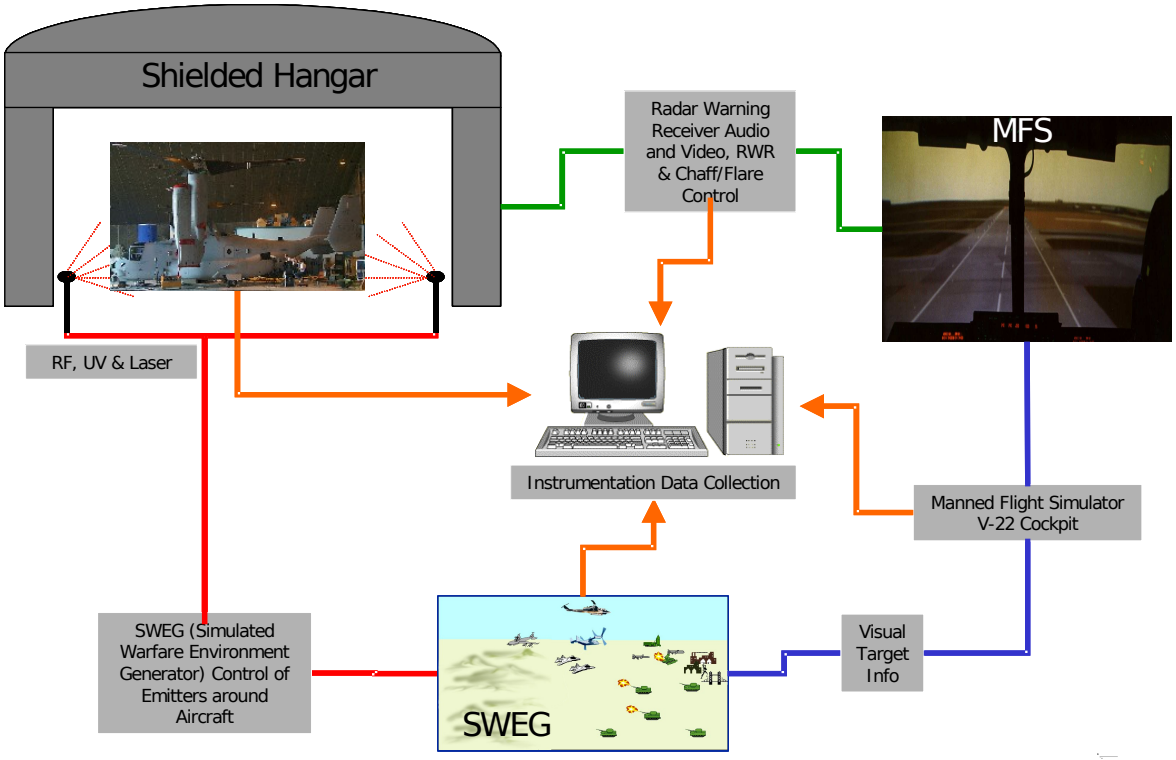
Powerful reactive modeling capability



Strength of this Architecture



Example Environment: MV-22 OT&E


Shielded Hangar
Radar Warning Receiver Audio and Video, RWR & Chaff/Flare Control
MFS
RF, UV & Laser
Instrumentation Data Collection
Manned Flight Simulator V-22 Cockpit
SWEG (Simulated Warfare Environment Generator) Control of Emitters around Aircraft
SWEG
Visual Target Info

Rigorous Accreditation Effort
- Lessons Learned with ALR-67
- TEAM effort w/OTD & ITT

Initial Trial during OT-IID
Subsequently supported OT-IIE

Highly realistic TRAP Mission
- Extensive re-use of JSF work
- Scenarios, data bases
- Tri-service validation efforts

Multi-Sensor Stimulation
- APR-39
- AAR-47
- AVR-2
- FLIR (Simulated)

Provided scenarios and threat density un-available in the US.

Lessons Learned & Issues

- **Integrated (LVC, Sim/Stim) Environment Approach serves the broadest range of needs.**

Design for integrated ops (external control), maximum flexibility.
Requires strong organic technical talent, commitment to continuous improvement.

Allow customer to use the models they trust and prefer.

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Lessons Learned & Issues

- **"Interoperability" Solutions/Mandates should be embraced in phases with the "leanest", most stable solution as a "backbone".**

The "double-ICD" approach works – one low-level, direct-connect to the model/stim, with "plug-ins" for other standards.

Maintain/develop organic technical talent with multi-standard fluency

Lessons Learned & Issues

- Confidence building is difficult and vital – CM, VV&A take time, cooperation and "visibility below the water line".

Software is far too often "below the water line"

The Navy must make every legal effort to OWN the software it buys.
Integrated Environments must be validated as a whole.

Must maintain strong organic technical talent.

Lessons Learned & Issues

- **Need an effective means of expressing model/stim characteristics/degree of detail.**

Model/stim characteristics are multi-dimensional, cumbersome to express in text.

Real details about internals must be available for evaluation.

An innovative means of organizing, presenting and retrieving such information is needed.

The Future

- Expand the customer base – develop confidence in the use of LVC environment as an OT risk reducer, and an interactive source of "the rest of the war".
- Address evolving warfighting needs with existing capability.
- Shorten the cycle time for testing, immersion in the environment, data production.
- Develop key enhancements to support future systems.

Questions?